

PATENT

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Claims:

1. A downhole pumping apparatus for pumping fluids from a wellbore, comprising:
 - a barrier extending along at least a portion of the wellbore to isolate an interior region of the wellbore from the adjacent earth;
 - a pump positionable in the wellbore in a producing region thereof;
 - a sleeve extending from the opening of the wellbore at the earth's surface to the centrifugal pump;
 - a drive member located outwardly of the bore;
 - a drive rod extending within said sleeve and interconnected to said pump and said drive motor; and
 - a dampening element positioned in contact with said drive rod within the wellbore when said drive rod is actuated by said motor to operate said pump.
2. The downhole pumping apparatus of claim 1, wherein said pump is a centrifugal pump.
3. The downhole pumping apparatus of claim 1, wherein said drive member is an electric motor.
4. The downhole pumping apparatus of claim 1, wherein said drive member rotates said drive rod.
5. The downhole pumping apparatus of claim 1, wherein said lubricant is an oil maintained in an annulus formed between said sleeve and said drive rod.
6. The downhole pumping apparatus of claim 1, wherein said drive means rotates said drive rod in excess of 3400 rpm.
7. The downhole pumping apparatus of claim 1, wherein said rod includes at least one mass imbalance portion therein.

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8. A lifting apparatus for lifting fluids from a downhole location to a location adjacent the opening of the wellbore to the earth's surface; comprising:

 a drive member locatable adjacent the opening of the borehole to the earth's surface;

 a pump locatable in a downhole location;

 a rod, extending from said drive member to said pump;

 said drive member configured to enable rotation of said rod;

 a sleeve disposed about said rod over at least a portion thereof extending within the wellbore; and

 a dampening element disposed between said sleeve and said rod.

9. The lifting apparatus of claim 8, wherein said pump is a centrifugal pump.

10. The lifting apparatus of claim 8, wherein said dampening element is a fluid maintainable between said rod and said sleeve.

11. The lifting apparatus of claim 8, further including production tubing extending from said pump to a location adjacent the opening of the wellbore in the earth; and

 said pump includes a pump outlet in fluid communication with said production tubing.

12. The lifting apparatus of claim 11, wherein said production sleeve extends within, and is substantially surrounded by, said production tubing.

13. The lifting apparatus of claim 8, further including casing extending along at least a portion of the borehole.

14. A method of recovery of fluids from a borehole, wherein the fluids exist at a pressure in the borehole insufficient to naturally drive them to the surface of their own accord, comprising:

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providing a pump in the borehole and having a fluid inlet, a fluid outlet, and an energy transfer mechanism to transfer energy to the well fluids sufficient cause them to be lifted to the opening of the borehole with the earth's surface;

positioning a drive member at a location remote from the pump to provide energy transferred through rotary motion to the pump;

extending an energy transfer mechanism from the pump to the drive member, the energy transfer member including an excursion-dampening element; and

pumping fluids from the wellbore.

15. The method of claim 14, wherein the pump is a centrifugal pump.

16. The method of claim 14, wherein the excursion-dampening member includes a drive rod received in a sleeve, and a lubricant positioned between the sleeve and the rod.

17. The method of claim 14, wherein said pump includes at least one impeller received within a diffuser housing and the impeller is rotatably driven by a rod extending down the wellbore from a drive mechanism located adjacent said wellhead.

18. The method of claim 14, wherein the drive rod includes at least one mass imbalance region therein.

19. A downhole pumping apparatus, comprising:

a centrifugal pump stack having an inlet, an outlet, and a plurality of impellers and diffuser housings in fluid communication therein received in a wellbore;

a drive rod extendible from a surface location, downwardly through said wellbore, and in physical coupled engagement with at least one of said impellers;

a drive member located adjacent to said wellbore and in physical driving engagement with said drive rod outwardly of said wellbore;

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said drive rod including a naturally occurring excursion element therein; and
an excursion prevention element disposed in relation to said drive rod to
prevent excursion of said drive rod.

20. The pumping apparatus of claim 19, wherein said drive member includes a motor coupled to said drive rod, and said drive rod is rotated thereby at speeds in excess of 3400 rpm.

21. The pumping apparatus of claim 19, wherein said excursion prevention mechanism includes:

a sleeve extending about the drive rod and forming an annulus therebetween therewith; and
a lubricant maintained within said annulus.

22. The pumping apparatus of claim 19, wherein said excursion element is a mass imbalance portion of said drive rod.

23. The pumping apparatus of claim 19, further including a production tube extending from a location in the well adjacent said surface location to a position coupled to said pump;

said pump includes a pump outlet coupled to the interior of said production tube; and

said sleeve extends within said wellbore within said production tube.

24. The apparatus of claim 21, wherein said lubricant is oil.